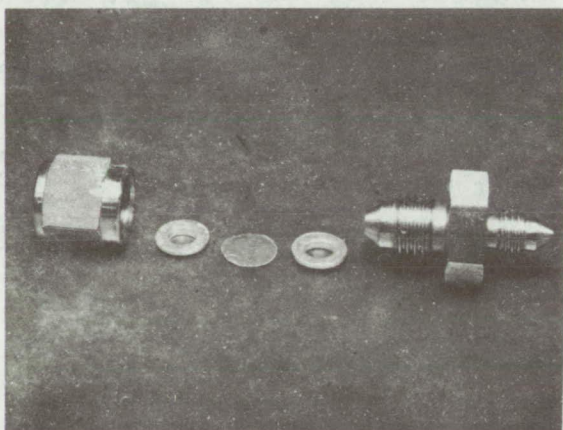


NASA TECH BRIEF



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Burst Diaphragm Leak Detector



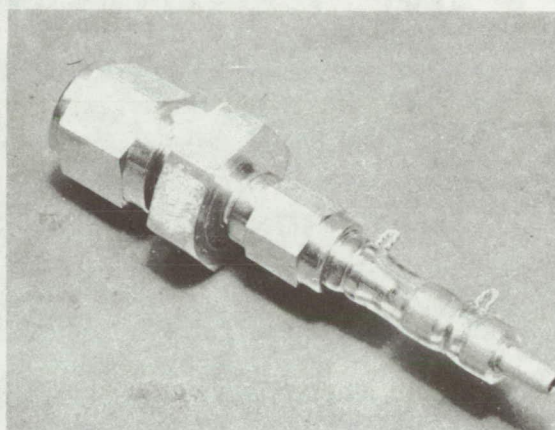
Disassembled Burst Diaphragm Flange Type

The problem:

To devise an inexpensive, rapid method for simultaneously leak checking flange seals in a rocket engine under actual operating conditions. In such an assembly there are as many as 70 to 75 individual flange seal installations throughout the system. Each of these installations is subject to possible leakage and requires a careful leak detection test to ensure functional integrity. Previously, each individual flange had to be leak checked by means of a flowmeter, resulting in considerable time loss and inconvenience.

The solution:

The new method replaces the time-consuming flowmeter approach with a simple, readily available burst diaphragm leak detector assembly mounted to all of the drain ports. This allows simultaneous leak detection of all flange seals under actual operating conditions.



Assembled Flexible Burst Diaphragm

How it's done:

The leak detector consists of a standard reducer of the proper size, two stainless-steel ball seat washers, a B-nut, or bushing. A properly sized metal diaphragm (nickel, silver, gold, or aluminum) with corresponding burst valve is inserted between the ball seat washers after LOX-safe lubrication has been applied. The assembly is then torqued to some given value, followed by a 30-psig, liquid nitrogen functional leak test using a soap solution. Any number of detectors can then be installed into flange seal leakage ports. During actual engine running, any leakage due to defective seal or flange creates a pressure buildup, ultimately causing rupture of the diaphragm.

Notes:

1. This information may be of interest to personnel engaged in the tests for leak detection in which a great number of sealed flanges require simultaneous leak checking.

(continued overleaf)

2. Requests for further information may be directed to:

Technology Utilization Officer
Marshall Space Flight Center
Huntsville, Alabama 35812
Reference: TSP69-10543

Patent status:

No patent action is contemplated by NASA.

Source: J. A. Pascolla of
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